

Application No.: 10/005669

Case No.: 57172US002

REMARKS

Claims 1 – 3, 7 – 22, 42, and 43 have been pending. Claims 7 and 43 are being cancelled. Claims 1 and 42 are being amended.

Applicants are hereby amending claim 1 to clarify that the polyacrylate component comprises an acrylic acid reactive functional group (basis therefor can be found, for example, at page 7, lines 19 – 28, and in the examples) and to add the limitation that the curable adhesive composition can be cured to form an adhesive comprising an inter-reacted interpenetrating polymer network (basis therefor can be found, for example, in claim 7).

Claim 42 is being amended to specify that the optical element comprises first and second material layers bonded together by a layer of the adhesive of the invention, and that at least one of the components comprise an outgassing layer comprising polycarbonate or acrylic (basis therefor can be found, for example, at page 3, line 29, through page 5, line 8).

Rejections under 35 U.S.C. § 112

Claims 1 – 3, 7 – 22, 42, and 43 were rejected under § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

The Examiner has asserted that the scope and meaning of “polyacrylate component containing acrylic acid” is ambiguous. Claim 1 has been amended to clarify that the polyacrylate component comprises an acrylic acid reactive functional group.

The Examiner has also asserted that claims 42 and 43 are ambiguous because it “is unclear if the adhesive per se is the optical element”. Applicants have amended claim 42 to specify that the adhesive layer is bonding first and second material layers. Amended claim 42 also includes the limitation that at least one of the components comprises an outgassing layer comprising polycarbonate or acrylic.

Thus, the rejections under § 112 have been obviated by the amendments, and Applicants therefore respectfully request that the rejections be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1 – 3, 7 – 15, 17 – 22, and 42 – 43 were rejected under § 103(a) as being unpatentable over U.S. Patent No. 5,897,727 (Staral et al.) in view of Japan 2-178380 (JP '380) and

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optionally U.S. Patent No. 6,319,603 (Komiya et al.). The rejection is respectfully traversed for the following reasons.

Staral discloses a pressure sensitive crosslinkable adhesive comprising (1) at least one polymer obtained from polymerization of at least one free-radically polymerizable monomer, (2) at least one cationically polymerizable monomer, (3) a photo-activatable catalyst system, and (4) optionally, a monohydric or polyhydric alcohol.

JP '380 discloses an adhesive comprising (a) an acrylic resin having functional groups reactive with epoxy groups, (b) polyfunctional epoxy resin, and (c) chromium-containing curing accelerator.

Komiya discloses a curable resin composition comprising (1) a (meth)acrylate polymer, (2) ring-opening polymerizable monomer containing at least one epoxy group, and (3) a cationic photopolymerization initiator.

Applicants disclose a curable adhesive composition comprising (1) polyacrylate component comprising an acrylic acid reactive functional group, (2) epoxy component, and (3) cationic initiator. When uncured, Applicants' curable adhesive composition exhibits properties of a pressure sensitive adhesive and is optically clear such that the luminous transmission of the composition is greater than 90%, the haze of the composition is less than 2%, and the opacity of the composition is less than 1%. The uncured, curable adhesive can be cured to form an adhesive comprising an inter-reacted interpenetrating polymer network, wherein after aging the cured adhesive at 90°C for 500 hours the luminous transmission of the cured and aged adhesive is greater than 90%, the haze of the cured and aged adhesive is less than 2%, and the opacity of the cured and aged adhesive is less than 1%.

The Examiner has asserted that Staral discloses a pressure sensitive adhesive (PSA) comprising a polyacrylate component, an epoxy component, and a cationic initiator. The Examiner also asserts that it would have been obvious to provide the PSA so as to have the claimed properties since Staral teaches using the PSA to bond an optical element. Finally, the Examiner has asserted it would have been obvious to provide Staral's polyacrylate component as a "polyacrylate component containing acrylic acid" in view of (1) JP '380's teaching to provide a pressure sensitive adhesive that comprises a polyacrylate component and an epoxy component such that the polyacrylate component is an acrylic resin having a functional group reactive with an epoxy group so that the adhesive has stabilized adhesive properties and keeps strong cohesion even at high temperatures, and optionally (2) Komiya, also disclosing an adhesive comprising a poly(meth)acrylate polymer, an epoxy component and a cationic initiator, suggests forming the poly(meth)acrylate polymer with a

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functional group such that a grafting reaction between the poly(meth)acrylate polymer and the epoxy component is obtained and so that the resulting adhesive undergoes the least change in characteristics when exposed to heat and light and maintains its transparency.

Applicants' curable adhesive composition comprises a polyacrylate component comprising an acrylic acid reactive functional group. The acrylic acid reactive functional group acts to connect the polyacrylate to the epoxy component and create an inter-reacted interpolymer network. (See, for example, page 7, lines 19 – 28.) Neither Staral nor Komiya appear to teach or suggest a curable adhesive composition comprising polyacrylate component comprising an acrylic acid reactive functional group. JP '380 discloses adhesives comprising an acrylic resin having functional groups. But, the resulting adhesive of JP '380 is a PSA (that is, the final state of the adhesive is the PSA state; there is no subsequent curing step to give a structural adhesive).

In addition, JP '380 does not teach or suggest an adhesive composition that is optically clear and possesses the claimed optical properties. In fact, it is very unlikely that the PSAs of JP '380 would be optically clear given that a chromium-based curing accelerator is used at relatively high concentrations (for example, at 0.5 – 10 wt. %). Therefore, one skilled in the art seeking to provide a curable and optically clear adhesive composition would not look to JP '380.

Applicants' curable adhesive composition also exhibits unexpected properties. "Often, components of an optical element, or other adjacent components, can adversely affect the stability, clarity, bond strength, or other performance property of an adhesive in the same optical element. Polycarbonates, for example, are known to outgas, producing bubbles or partial or full delamination at the adhesive bond between the polycarbonate and another layer of an optical element. Bubbling and delamination can be particularly common when the outgassing layer is bonded to another layer or laminate that exhibits low vapor transmissivity. Bubbles and delamination can affect clarity and integrity of the optical element, and must be avoided." (See, for example, page 2, lines 3 – 12). Applicants' adhesive composition can be optically transmissive and can maintain a structural integrity to resist combined effects such as outgassing and low moisture vapor transmission (page 4, lines 10 – 12). It can be used for bonding materials that tend to outgas, and where such outgassing tends to compromise integrity of an adhesive bond between the outgassing material and another material. More specifically, Applicants' adhesive composition can be used to bond an outgassing material to a material that has a low moisture vapor transmission rate (page 4, lines 26 – 30).

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Neither Staral, JP '380, nor Komiya appears to teach or suggest an adhesive composition that can be used for bonding materials that tend to outgas, or to bond an outgassing material to a material that has a low moisture vapor transmission rate. Applicants' claims are therefore unobvious and patentable over the combined references, and Applicants respectfully request that the rejection under § 103(a) based on Staral in view of JP '380 and optionally Komiya be withdrawn.

Claims 15 – 16 and 18 – 20 were rejected under § 103(a) as being unpatentable over Staral in view of JP '380 and optionally Komiya and further in view of U.S. Patent No. 5,905,099 (Everaerts et al.) and/or EP 729494 (EP '494). The rejection is respectfully traversed for the following reasons.

For at least the reasons discussed above, claims 15, 16, and 18 – 20 are unobvious and patentable over Staral in view of JP '380 and optionally Komiya and further in view of Everaerts. Applicants therefore respectfully request that the rejection under § 103(a) based thereon be withdrawn.

Concluding Remarks

In view of the above, Applicants believe that the application is now in condition for allowance. Therefore, reconsideration and allowance of Applicants' claims are respectfully requested.

Respectfully submitted,

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Date

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